SMART Pressure Transmitter

Differential/Gage/Absolute

HART COMMUNICATION PROTOCOL CE Ex

FT3351 Series

		
Gage+Direct +Heat Sink+Ext. Tube	Gage+Direct +Extension Tube	Differential +Direct +Heat Sink+Extension Tube
		
Differential +Two Capillary		Gage+Capillary+Ext. Tube+Brucket Mounting
		
Differential + Thermal Compernsator + Flushing Ring		

The Proven Industry Leader in Pressure Measurement

- Best-in-Class performance with 0.075% reference accuracy
- Standard platform enables integrated pressure, flow and level solutions
- Power Advisory Diagnostics provide predictive visibility to the health of your entire electrical loop
- Selectable HART™ Revision prepares your plant for the latest HART capabilities while ensuring seamless integration with today's systems
- Local Operator Interface (LOI) offers easy to use configuration capabilities at the transmitter

Setting the standard for pressure measurement

Proven best-in-class performance, reliability and safety

- Meet your application needs with extensive offering
- Excellent long term stability of ±0.1% URL per year
- Reference accuracy of ±0.075% URL
- Low Temperature Drift of ±0.1% URL per 45°C

Maximize Installation Flexibility with Standard Platform

- Improve reliability and performance with integrated DP Flow meters, DP Level and Manifolds
- Easy installation with all solutions fully assembled, leak-tested and calibrated
- Meet your application needs with an unsurpassed offering

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Technical Information

➢ FT3351 series digital differential pressure transmitter, multi-functional smart pressure transmitter, is designed for industrial pressure measurement applications, based on our years of rich industrial manufacturing experience, adopting modern advanced, mature, reliable capacitive sensor technology, also combined with advanced single-chip computer technology and sensor digital conversion technology.

➢ CPU adopts sixteen single chips, whose powerful features and high-speed computing power ensures the transmitter with good quality and performance. The software has digital signal processing technology making transmitter with excellent anti-interference ability and zero stability, with zero automatic stable tracking ability (ZSC) and automatic temperature compensation ability (TSC).

➢ Powerful interface features without hand held communicator are able to ensure good interaction. LCD indicator can display the digital pressure, temperature, current three kinds of physicals and 0-100% analog indication. In case of non-standard pressure source, parameter setting zero shift, range setting damping adjustment can be by press key button; and also re-calibration on the transmitter are greatly convenient for on-site calibration.

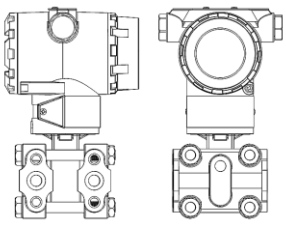
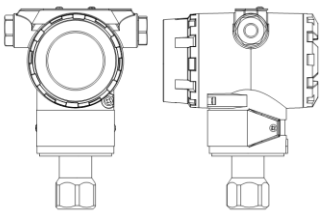
➢ Serial interface communication can be converted to 4-20mA DC current signal output by via specified converter module, also available through Hart protocol(RS485 module) to set and monitor remote transmission, directly connecting with master device, such as paperless recorder, controller, indicator etc. instrument, HMI, IPC, PC, Industrial Lan.

➢ FT3351 are used to measure differential pressure, gauge pressure, absolute pressure. parameters for gas, liquid, vapor, widely applied in petroleum, metallurgy, chemicals, power, light industry, mechanical and environmental protection fields.

➢ Enclosure Type IP68

Application

- Flow measurement (volume or mass flow) in conjunction with primary elements in gases, vapors and liquids
- Level, volume or mass measurement in liquids.
- Differential pressure monitoring, e.g. of filters and pumps.

FT3351BD/CD	**FT3351CG/CA**
	
Typical Model Number:	Typical Model Number:
FT3351CD 2 1 A 2 2 A 1 A 1 M4	FT3351CG 2 A 2 2 A 1 A 1 M4

Performance Specifications:

Total Performance is based on combined errors of reference accuracy, ambient temperature effect, and static pressure effect.
This product data sheet covers both HART unless specified.

FT3351C **Accuracy**

Range 0 ±0.10% of span, for spans less than 2:1, accuracy = ±0.05% of URL

Range 1 ±0.10% of span, for spans less than 15:1, accuracy = ±[0.025 + 0.005(URL/Span)]% of Span

Ranges 2-4 ±0.075% of span, for spans less than 10:1, accuracy = ±[0.015 + 0.005(URL/Span)]% of Span

Line Pressure Effect per 1000 psi (6,9 MPa)

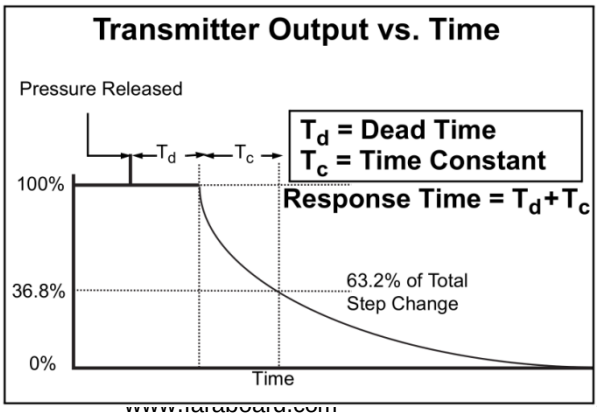
FT3351C	**Zero Drift**
Range 0	±0.125% of URL/100 psi (6,89 bar)
Range 1	±0.25% of URL/1000 psi (68,9 bar)
Ranges 2-4	±0.05% of URL/1000 psi (68,9 bar)

	Span Drift
Range 0	±0.15% of reading/100 psi (6,89 bar)
Range 1	±0.4% of reading/1000 psi (68,9 bar)
Ranges 2-4	±0.1% of reading/1000 psi (68,9 bar)

Dynamic Performance

FT3351 Range 2,3,4 Output	4 - 20 mA + HART
Time Constant (Tc)	60 ms
Dead Time (Td)	60 ms
Update Rate	16 times per Second

Total Response Time (T d + T c)



Turn-On Time

Performance within specifications less than 1 second after power is applied to the transmitter.

Long Term Stability

FT3351C

Ranges 0-1 ±0.2% of URL for 1 year
Ranges 2-4 ±0.15% of URL for 5 year

Ambient Temperature Effect per 50°F (28°C)

FT3351C

Range 0 ±(0.25% URL + 0.05% span)
Range 1 ±(0.1% URL + 0.25% span)
Ranges 2-4 ±(0.0125% URL + 0.0625% span)

Maximum Overload Pressure:

- **Gage & absolute Pressure Transmitter:**

Pressure Range	Maximum Overload Pressure
1	0.3 MPa (3 bar)
2	1 MPa (10 bar)
3	4 MPa (40 bar)
4	15 MPa (150 bar)
5	20 MPa (200 bar)
6	60 MPa (600 bar)

- **Differential Pressure Transmitter:**

Pressure Range	Maximum Overload Pressure
0	1.3*Working Pressure
1	1.3*Working Pressure
2	1.5*Working Pressure*
3	1.5*Working Pressure*
4	1.5*Working Pressure*

* for Working Pressure 400 bar, Maximum Overload Pressure Will be 40 MPa.

More than above mentioned over load pressure the whole diaphragm seal system will be failed.

Zero and Span Adjustment Requirements (HART and Low Power)
Zero and span values can be set anywhere within the range limits
Span must be greater than or equal to the minimum span stated in

Service
Liquid, gas, and vapor applications

4–20 mA Output Signal
Two-wire 4–20 mA, user-selectable for linear or square root output. Digital process variable superimposed on 4–20 mA signal, available to any host that conforms to the HART protocol.

Power Supply
External power supply required.

Standard transmitter: 12 to 36 V dc with no load.
Explosion Proof version : 12 to 29.4 V dc with no load.

Power Supply Effect
All Models
less than ±0.005% of calibrated span per volt.

Transient Protection Spec:
In all models of FT3351 series there is the integral transient protection board inside wire terminal cover regarding to following specification

Response Time: < 1 nanosecond
Peak Surge Current: 5000 amps to housing
Peak Transient Voltage: 100 V dc
Loop Impedance: < 25 ohms
Applicable Standards: IEC61000-4-4, IEC61000-4-5

Load Limitations
Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

Max. Loop Resistance = 45 x (Supply Voltage – 12)

Table 01: Order Code FT3351C Differential

Pressure Transmitter , Class C, 0.075% Accuracy

Model	**Transmitter type**		
FT3351C	Pressure transmitter 0.075% Accuracy		
Measurement type			
D	Differential		
Pressure Range	**Min. Span Limit**	**Upper Range Limit**	
0	0.3 mbar	4 inH2O(10 mbar)	
1	1.2 mbar	24 inH2O(60 mbar)	
2	4 mbar	160 inH2O(400 mbar)	
3	25 mbar	250 kPa(2.5 bar)	
4	0.3 bar	3000 kPa(30 bar)	
9	Special Range		
Working Pressure			
A	0.2 MPa (Apply only to Pressure range 0 , 1)		
B	7 MPa (Apply only to Pressure range 0 , 1)		
1	16 MPa		
2	25 MPa		
3	40 MPa		
Transmitter Output			
A	4–20 mA with Digital Signal Based on HART Protocol		
Materials of Construction			
	Process Flange Type	**Flange Material**	**Drain/Vent**
2	Standard 1/4 -18 NPT Female	SST	SST
3	Standard 1/4 -18 NPT Female	Cast C-276	Alloy C-276
4	Standard 1/4 -18 NPT Female	Cast Alloy 400	Alloy 400/K-500
5	Standard 1/4 -18 NPT Female	Plated CS	SST
6	Standard 1/4 -18 NPT Female	SST	Alloy C-276
7	Standard 1/4 -18 NPT Female	Plated CS	Alloy C-276
0	Alternate Flange –See options on next page		
Isolating Diaphragm			
2	316L SST		
3	Alloy C-276 (Hastelloy)		
4	Tantalum		
5	Gold Plated on 316L		
Z	Special Version		
O-ring			
A	Glass-filled PTFE		
B	Graphite-filled PTFE		
C	FKM viton		
D	Fluoroplastics		
Sensor Fill Fluid			
1	Silicone		
2	Fluorocarbon oil		
Z	Special Version		
Housing Material		**Conduit Entry Size**	**Enclosure Type**
A	Aluminum	½–14 NPT	IP 68
B	Aluminum	M20 × 1.5	IP 68

J	SST	½–14 NPT	IP 68
K	SST	M20 × 1.5	IP 68
Electrical Entry Gland			
1	Without Gland (Plastic cover)		
2	PG13 Plastic Gland		
3	PG13 SS316 Gland		

Options:

Alternate Flange		
H3	Standard Flange, Alloy C, Alloy C-276 Drain/Vent	
HJ	DIN Compliant Standard Flange, SST, 1/16 in. Adapter/Manifold Bolting	
Remote Seal		
RSH	Remote Seal for High-Side	
RSL	Remote Seal for Low-Side	
RSHL	Remote Seal for High & Low Side	Refer to Remote Seal Selection Table 03 FahmCo Remote Seal Datasheet
Manifold Assembly		
S3	3-Way valve Manifold	
S5	5-Way valve Manifold	
Mounting Bracket		
B1	Standard Flange Bracket for 2-in. Pipe Mounting, CS Bolts	
B2	Standard Flange Bracket for Panel Mounting, CS Bolts	
B3	Standard Flange Flat Bracket for 2-in. Pipe Mounting, CS Bolts	
B4	Standard Flange Bracket for 2-in. Pipe or Panel Mounting, all SST	
Product Certifications(1)		
I1	ATEX Intrinsic Safety and Dust EEx ia IIC T4	
I2	ATEX Intrinsic Safety and Dust EEx ib IIC T6	
E8	ATEX Explosion-proof, Ex d IIC T5 (–50 ≤ Ta ≤ 80 °C) Ga/Gb	
Display and Interface Options		
M4	LCD Display with Local Operator Interface	
M5	LCD Display	
Configuration buttons		
D4	Analog zero and span	
DZ	Digital zero trim	
Calibration Certificate		
Q4	Calibration Certificate	

Wetted Part Material Certificate		
Q8	Material Certification per EN 10204 3.1	
Alarm Levels		
C4	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High	
CN	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm Low	
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)	
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)	
CT	Low alarm (standard alarm and saturation levels)	
Pressure Testing		
P1	Hydrostatic Testing with Certificate	
Flange Adapters		
DF	1/2 -14 NPT Oval flange adapter(s) female	
Z	Special Version	
Vent/Drain Valve		
D7	Required side vent valve ¼ NPT	
Max Static Line Pressure		
P9	4500 psig (310 bar) Static Pressure Limit (3351CD Ranges 2–5 only)	
Ground Screw		
V5	External Ground Screw Assembly	
Conduit Electrical Connector		
GE	M12, 4-pin, Male Connector (eurofast®)	
GM	A size Mini, 4-pin, Male Connector (minifast®)	
NACE Certificate		
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials	
Typical Model Number: FT3351CD 2 1 A 2 2 A 1 A 1 M4 D4		

1. Requires electrical entry gland code 3

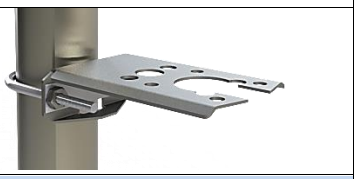
Table 02: Order Code FT3351C Gage/Absolute

Pressure Transmitter, Class C, 0.075% Accuracy

Model	**Transmitter type**			
FT3351C	Pressure transmitter 0.075% Accuracy			
Measurement type				
G	Gage			
A	Absolute			
Pressure Range	**FT3351CG**	**Min. Span Limit**	**FT3351CA**	**Min. Span Limit**
1	-24 to 24 inH2O (–60 to60 mbar)	1.2 mbar	Not Applicable	Not Applicable
2	-160 to 160 inH2O (–400 to 400 mbar)	4 mbar	0 to 160 inH2O (0 to 400 mbar)	4 mbar
3	–98 to 250 kPa (–0.98 to 2.5 bar)	25 mbar	0 to 250 kPa (0 to 2.5 bar)	25 mbar
4	–98 to 3000 kPa (–0.98 to 30 bar)	0.3 bar	0 to 3000 kPa (0 to 30 bar)	0.3 bar
5	–0.098 to 10 MPa (–0.98 to 100 bar)	1 bar	Not Applicable	
6	–0.098 to 40 MPa (–0.98 to 400 bar)	4 bar	Not Applicable	
9	Special Range			
Transmitter Output				
A	4–20 mA with Digital Signal Based on HART Protocol			
Materials of Construction				
	Process Connection		Material	
F	½-14 NPT Female		SST	
M	½-14 NPT Male		SST	
N	Direct Mount and capillary Refer to Remote Seal Selection Table 03 FahmCo Remote Seal Datasheet			
Z	Special Version refer to custom request			
Isolating Diaphragm				
2	316L SST			
3	Alloy C-276 (Hastelloy)			
4	Tantalum			
5	Gold Plated on 316L			
Z	Special Version			
O-ring				
A	Glass-filled PTFE			
B	Graphite-filled PTFE			
C	FKM viton			
D	Fluoroplastics			
Sensor Fill Fluid				
1	Silicone			
2	Fluorocarbon oil			
Z	Special Version			
Housing Material		**Conduit Entry Size**	**Enclosure Type**	
A	Aluminum	½–14 NPT	IP 68	
B	Aluminum	M20 × 1.5	IP 68	
J	SST	½–14 NPT	IP 68	
K	SST	M20 × 1.5	IP 68	

Electrical Entry Gland	
1	Without Gland (Plastic cover)
2	PG13 Plastic Gland
3	PG13 SS316 Gland

Options:

Manifold Assembly	
S2	2-Way valve Manifold
S3	3-Way valve Manifold
Mounting Bracket	
B4	Bracket for 2-in. Pipe or Panel Mounting, all SST (Stainless Steel)
B5	Bracket for 2-in. Pipe or Panel Mounting, all CS (Carbon Steel)
Product Certifications	
I1	ATEX Intrinsic Safety and Dust EEx ia IIC T4
I2	ATEX Intrinsic Safety and Dust EEx ib IIC T6
E8	ATEX Explosion-proof, Ex d IIC T5 (–50 ≤ Ta ≤ 80 °C) Ga/Gb
Display and Interface Options	
M4	LCD Display with Local Operator Interface
M5	LCD Display
Configuration buttons	
D4	Analog zero and span
DZ	Digital zero trim
Calibration Certificate	
Q4	Calibration Certificate
Wetted Part Material Certificate	
Q8	Material Certification per EN 10204 3.1
Alarm Levels	
C4	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm High
CN	Analog Output Levels Compliant with NAMUR Recommendation NE 43, Alarm Low
CR	Custom alarm and saturation signal levels, high alarm (requires C1 and Configuration Data Sheet)
CS	Custom alarm and saturation signal levels, low alarm (requires C1 and Configuration Data Sheet)
CT	Low alarm (standard alarm and saturation levels)
Pressure Testing	
P1	Hydrostatic Testing with Certificate
High Accuracy	
P8	0.04% Accuracy to 5:1 turndown (Range 2-4)
Max Static Line Pressure	
P9	4500 psig (310 bar) Static Pressure Limit (3351CD Ranges 2–5 only)
Ground Screw	
V5	External Ground Screw Assembly
Conduit Electrical Connector	
GE	M12, 4-pin, Male Connector (eurofast®)
GM	A size Mini, 4-pin, Male Connector (minifast®)
NACE Certificate	
Q15	Certificate of Compliance to NACE MR0175/ISO 15156 for wetted materials
Typical Model Number: FT3351CG 2 A N 2 A 1 A 1 M4 D4	

Diaphragm seal with flange connection/ flush diaphragm FRS Series

Diaphragm seals of flange design
for gage and absolute pressure, directly fitted on transmitter

Technical specifications
Diaphragm seals (flange design) for pressure and absolute pressure,
Directly fitted on a transmitter

Nominal Diameter Nominal Pressure

• DN 50	PN 10-40, PN 100
• DN 80	PN 10-40, PN 100
• DN 100	PN 16, PN 40
• 2 inch	Class 150, class 300, class 600, class 1500
• 3 inch	Class 150, class 300, class 600, class 900
• 4 inch	Class 150, class 300, class 400
•6 inch	Class 150

Sealing face

• For stainless steel, mat. No.	To EN 1092-1, form B1 or ASME1.4404/316LB16.5 RF 125 ... 250 AA
• For the other materials	Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF

Materials

• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L
• Without foil	
• Capillary	Stainless steel, 1.4571/316Ti

Maximum pressure	See above and the technical data of the transmitter
Tube length	• Without tube • 50 mm (1.97 inch) • 100 mm (3.94 inch) • 150 mm (5.91 inch) • 200 mm (7.87 inch)

Capillary

• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)

Filling liquid	• Silicone oil M5 • Silicone oil M50

Permissible ambient temperature Dependent on the pressure transmitter and the filling liquid of the remote seal.
More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals.

FUNCTIONAL CHARACTERISTICS

Accuracy: at 20°C ±0.1% … 1% according to the chemical seal. Those values must be added to the accuracy class of the indicating instrument. The accuracy of vacuum however cannot be guaranteed beyond -0.85 bar in the standard executions. This is due to the fact that most filling fluids contain microscopic amounts of air or trapped gases, which tend to expand significantly as a pressure of absolute zero is approached. This expansion effects the measuring element in the instrument.

Process fluid temperature: minimum -40°C, max +399°C, according to the type of filling fluid used and of the material of diaphragm and of the process connection.

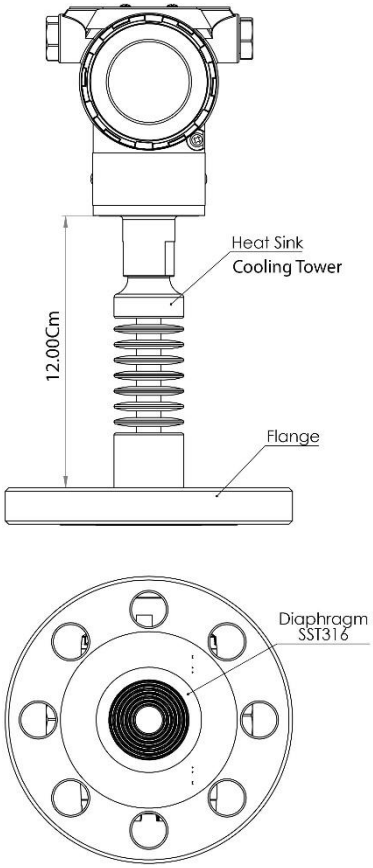
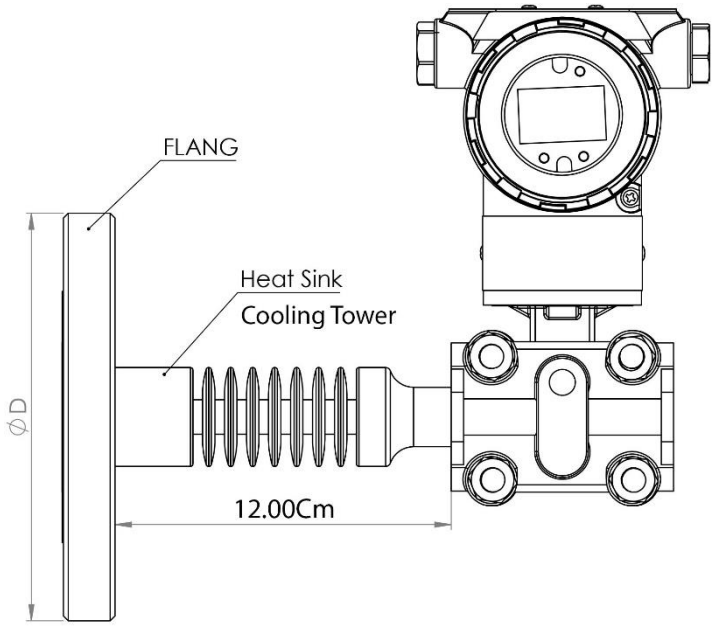
Table 03: Order Code Remote/Diaphragm Seal

Flange Remote Seal	**FRS-**	
Flange Type		
Flat Flange Type:	F	
Extension Flange Type:	E	
Raised Flange Type	R	
Sandwich Seal Type	S	
Flange Size		
XXX: Size of Flange for DN Flanges Y: Size of Flange for ANSI Flanges	DN[xxx]	S[y]
Pressure Rating		
xxx: Pressure Rating for DN Flanges yyy: Class Rating for ANSI Flanges	PN[xxx]	C[yyy]
Facing Type		
Flat Face	FF	
Raised Face	RF	
Ring Type Joint	RTJ	
Wetted parts materials (Flanges, Connections/Fittings, Tubes)		
Stainless steel 316L	A	
Special Version	Z	
Diaphragm Material		
316L SS	2	
Titanium GR-3	3	
Alloy C-276 (Hastelloy)	4	
Tantalum (Pure)	5	
Alloy-400 (Monel)	6	
Extension Tube Length (mm)		
Without Extension tube	T0	
Extension Tube length: ...	T [xx]	
Filling liquid		
Silicone oil DC 200 (General purpose)	F1	
Silicone oil DC 704 (High temperature)	F2	
Capillary / Direct length(cm)		
Direct (Without Capillary)	D [xx]	(Standard 12cm)
Capillary Length	L [yyy]	
Option		
Heat Sink Interface	H	
Capillary with Thermal Compensator	TC	
Flushing Ring	R	

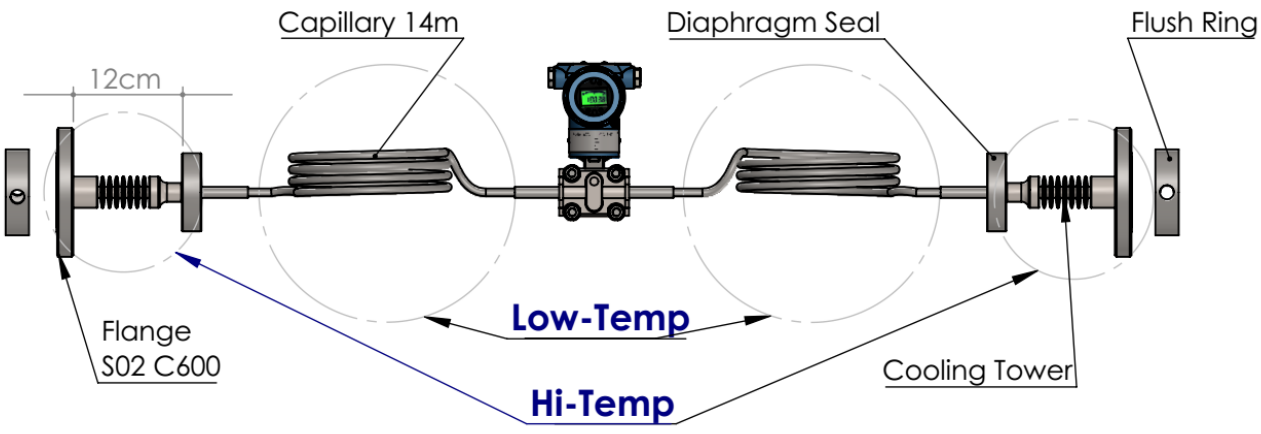
Sample Code	**FRS- F S02 C300 RF A 2 T0 F1 L200** **FRS- E DN50 PN16 FF A 2 T0 F2 DH**

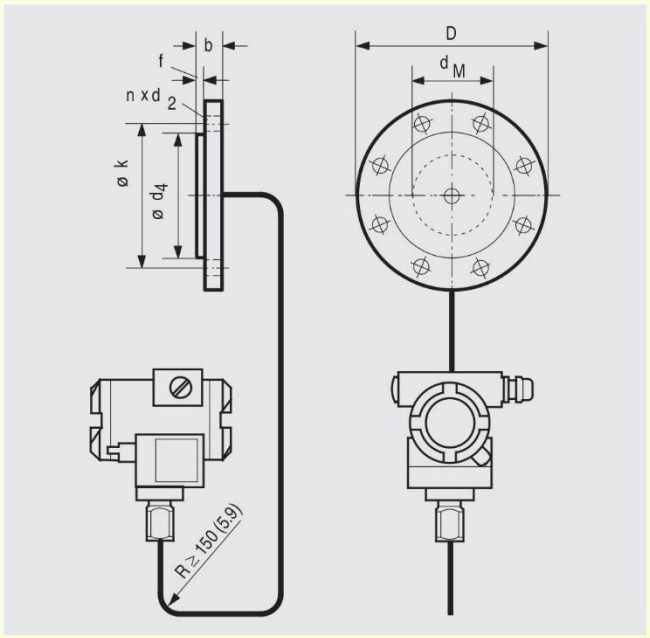
For more information see "Remote/Diaphragm Seal Datasheet: FahmCo Remote Seal Datasheet" Document

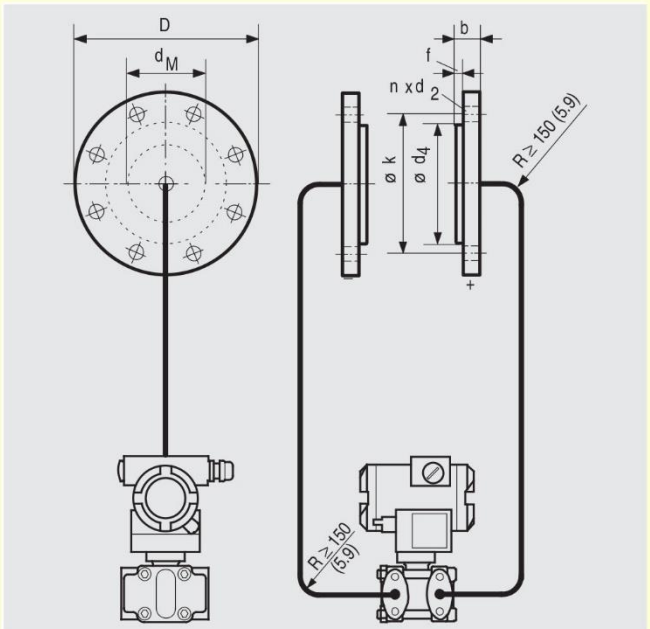
Direct Mount Dimensional Drawings

FT3351CG + Heat Sink	FT3351CD + Heat Sink
	

FT3351CD + Thermal Compensator







Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d_2 mm	d_4 mm	d_M mm	f mm	k mm	n
DN 50	PN 40	20	165	18	102	59	2	125	4
	PN 100	28	195	26	102	59	2	145	4
DN 80	PN 40	24	200	18	138	89	2	160	8
	PN 100	32	230	26	138	89	2	180	8
DN 100	PN 16	20	220	18	158	89	2	180	8
	PN 40	24	235	22	162	89	2	190	8
DN 125	PN 16	22	250	18	188	124	2	210	8
	PN 40	26	270	26	188	124	2	220	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
2 inch	150	20 (0.79)	150 (5.80)	20 (0.79)	92 (3.62)	59 (2.32)	1.6 (0.06)	120.5 (4.74)	4
	300	22.5 (0.89)	165 (6.50)	20 (0.79)	92 (3.62)	59 (2.32)	1.6 (0.06)	127 (5)	8
	600	32 (1.26)	165 (6.50)	20 (0.79)	92 (3.62)	59 (2.32)	1.6 (0.06)	127 (5)	8
3 inch	150	24 (0.96)	190 (7.48)	20 (0.79)	127 (5)	89 (3.50)	1.6 (0.06)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	89 (3.50)	1.6 (0.06)	168.5 (6.63)	8
	400	38.5 (1.52)	210 (8.27)	22 (0.87)	127 (5)	89 (3.50)	6.4 (0.25)	168.5 (6.63)	8
4 inch	150	24 (0.95)	230 (9.06)	20 (0.79)	158 (6.22)	89 (3.50)	1.6 (0.06)	190.5 (7.5)	4
	300	32 (1.26)	255 (10.04)	22 (0.87)	158 (6.22)	89 (3.50)	1.6 (0.06)	200 (7.87)	8
	400	41.5 (1.62)	255 (10.04)	26 (1.02)	158 (6.22)	89 (3.50)	6.4 (0.25)	200 (7.87)	8
5 inch	150	24 (0.94)	255 (10.04)	22 (0.87)	186 (7.32)	124 (4.88)	2 (0.08)	216 (8.50)	4
	300	35 (1.38)	280 (11.02)	22 (0.87)	186 (7.32)	124 (4.88)	2 (0.08)	235 (9.25)	8
	400	45.5 (1.79)	280 (11.02)	26 (1.02)	186 (7.32)	124 (4.88)	7 (0.28)	235 (9.25)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5
d_M: Effective diaphragm diameter

Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d_2 mm	d_4 mm	d_M mm	f mm	k mm	n
DN 80	PN 40	24	200	18	138	89	2	160	8
	PN 100	32	230	26	138	89	2	180	8
DN 100	PN 16	20	220	18	158	89	2	180	8
	PN 40	24	235	22	162	89	2	190	8
DN 125	PN 16	22	250	18	188	124	2	210	8
	PN 40	26	270	26	188	124	2	220	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d_2	d_4	d_M	f	k	n
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
3 inch	150	24 (0.96)	190 (7.48)	20 (0.79)	127 (5)	89 (3.50)	1.6 (0.06)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	89 (3.50)	1.6 (0.06)	168.5 (6.63)	8
	600	38.5 (1.52)	210 (8.27)	22 (0.87)	127 (5)	89 (3.50)	6.4 (0.25)	168.5 (6.63)	8
4 inch	150	24 (0.95)	230 (9.06)	20 (0.79)	158 (6.22)	89 (3.50)	1.6 (0.06)	190.5 (7.5)	4
	300	32 (1.26)	255 (10.04)	22 (0.87)	158 (6.22)	89 (3.50)	1.6 (0.06)	200 (7.87)	8
	400	41.5 (1.62)	255 (10.04)	26 (1.02)	158 (6.22)	89 (3.50)	6.4 (0.25)	200 (7.87)	8
5 inch	150	24 (0.94)	255 (10.04)	22 (0.87)	186 (7.32)	124 (4.88)	2 (0.08)	216 (8.50)	4
	300	35 (1.38)	280 (11.02)	22 (0.87)	186 (7.32)	124 (4.88)	2 (0.08)	235 (9.25)	8
	400	45.5 (1.79)	280 (11.02)	26 (1.02)	186 (7.32)	124 (4.88)	7 (0.28)	235 (9.25)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5
d_M: Effective diaphragm diameter

Miniature Remote Seal (MRS)

Overview:

The FAHM Co. all-welded flush mini-diaphragm seal or isolation device protect pressure measuring instruments. Used to ensure process compatibility, they are also applied when process media exhibits high temperature, pulsation, and a potential for plugging or freeze-up.

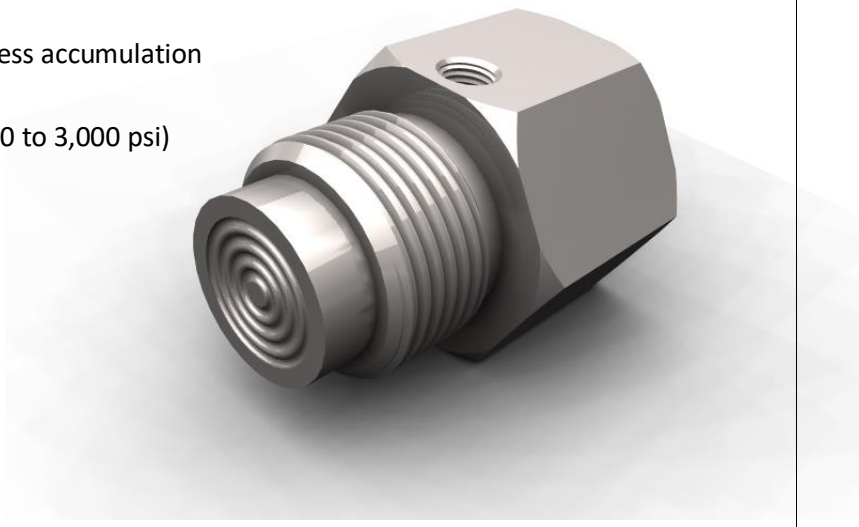
An ideal choice for limited space applications.

Key Features:

- Compact and lightweight design
- All-welded construction
- Flush diaphragm; eliminates clogging or process accumulation
- Volumetric displacement;

For use with 3 1/2" pressure gauges or smaller (60 to 3,000 psi)

- Pressure rated up to 3,000 psi



Applications:

- Process Market:
  - Pulp and Paper
  - Chemical and Petrochemical
- Medical & Life Sciences Market:
  - Pharmaceutical
  - Food and Beverage

SPECIFICATIONS

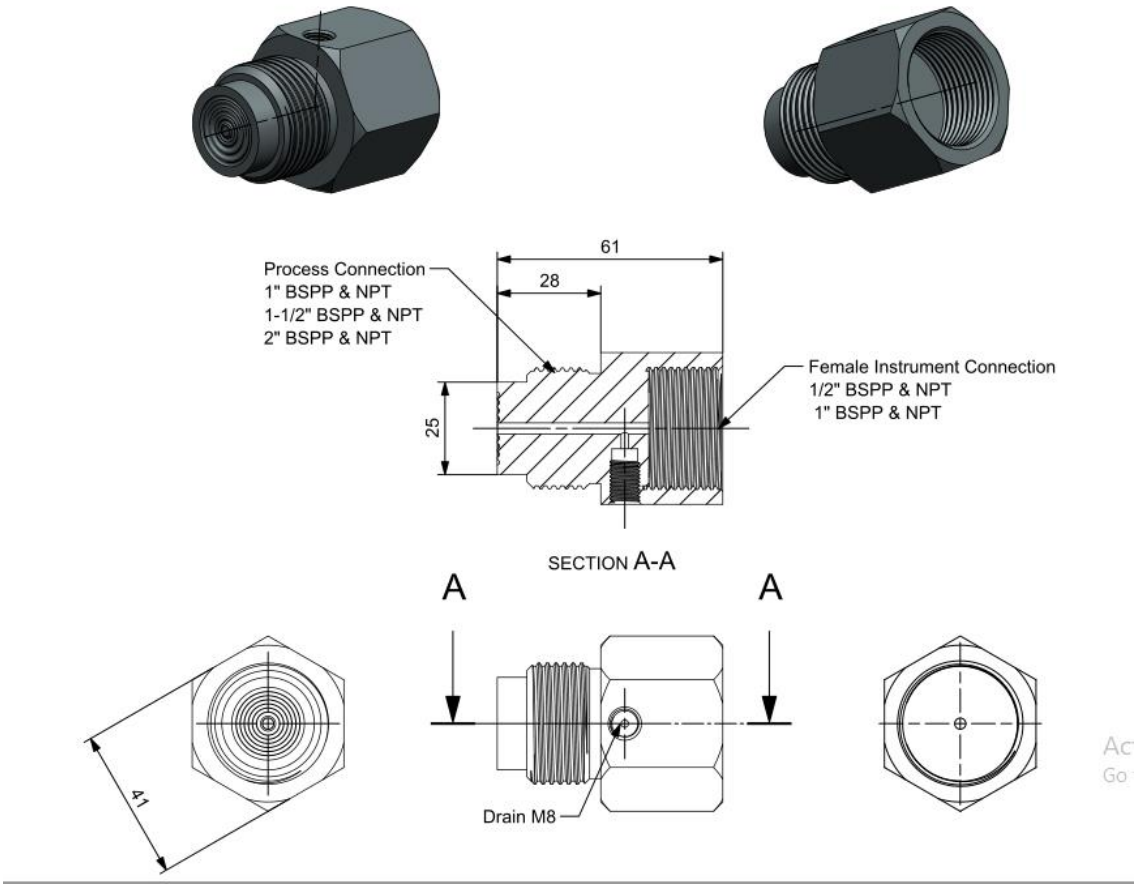
- Connection style: Threaded
- Process Connection: 1 NPT
- Instrument Connection: 1/4 , 1/2, 3/4 , 1 NPT or BSPP Female and Male
- MAWP: 3,000 psi

For more information see FRS (Remote Seal) Datasheet.

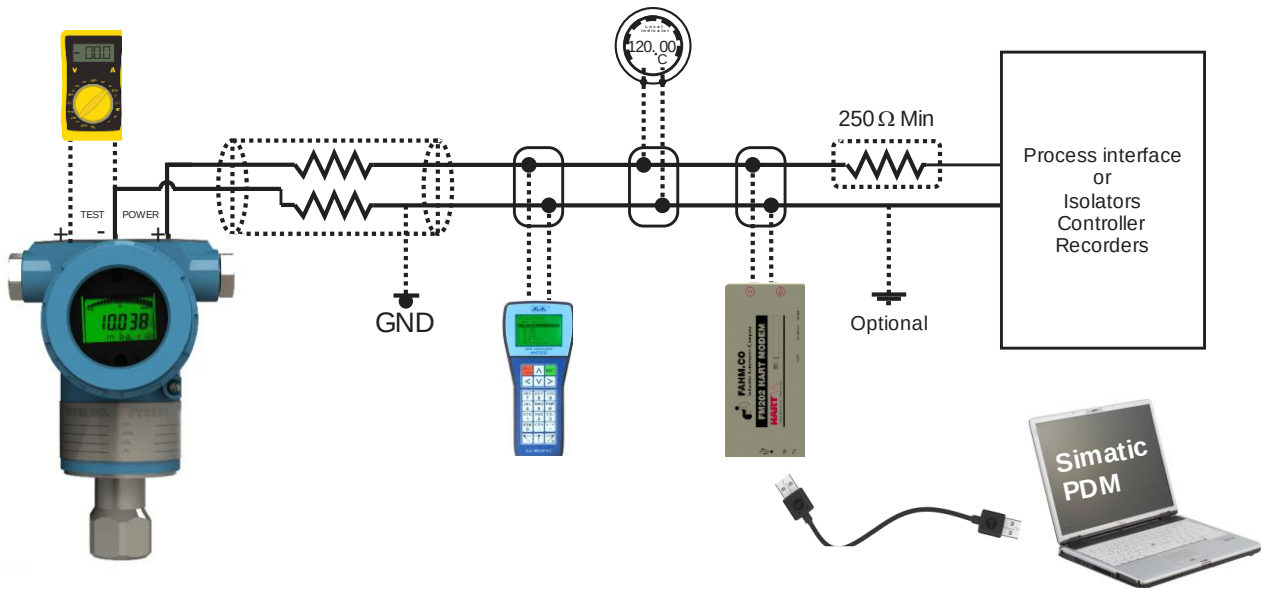
Miniature Remote Seal Order Code

Miniature Remote Seal	**MRS-**
Model	
Flush Threaded Seal	T
Process Connection (Male Thread)	
1" BSPP (G1B)	G1
1-1/2" BSPP (G1-1/2B)	G1.5
2" BSPP (G2B)	G2
1" NPT	N1
1-1/2" NPT	N1.5
2" NPT	N2
Body Material	
316 Stainless Steel	SS
Diaphragm Material	
316L SS	2
Titanium GR-3	3
Alloy C-276 (Hastelloy)	4
Tantalum (Pure)	5
Alloy-400 (Monel)	6
Instrument Connection Size	
1/2 NPT Male (Standard for Direct Mount to Pressure Sensor)	C0
1/2 BSPP (G1/2") Female	C1
1 BSPP (G1") Female	C2
1/2 NPT Female	C3
1 NPT Female	C4
Others	Z
Filling liquid	
Silicone oil DC 200 (General purpose)	F1
Silicone oil DC 704 (High temperature)	F2
Sample Order Code: MRS-T G1 SS 2 C0 F1	

Miniature Remote Seal Dimensional Drawings



FT3351 Hart Configuration Diagram



FAHM HART Modem

The **FM202** HART Modem is a powerful device for connection to all 4-20mA apparatuses for Configuration and calibration via PC and PC-based software.

Features

- Connect to computer through USB port
- Support USB 2.0
- Support HART Protocol (version 5.0 and 6.0)
- Hand-Held and Hart-Modem functioning modes
- No 24vDC Power Supply needed in HART-Modem mode
- Super low power design for extended portable computer battery life
- Provide instruments with max. 25mA in Hart-Modem mode
- No external 250Ohm Resistor needed in Hart-Modem mode
- LED indicator to display Power-On
- Separate LED indicator to display data transfer
- Galvanic isolation between computer and instruments to prevent Ground Loop
- Isolation Voltage: 1500 VAC
- Includes USB drivers for Windows 7, Vista, XP, and 2000

Metal Capacitive sensor

Description:

The type metal capacitive pressure sensor core, which is unique in the package and integrated in a sealed chamber, which provides a real time temperature parameter for the digital compensation circuit of the sensor.

Therefore, the film can be accurately compensated for temperature. In this way, the accuracy level of which can usually reach 0.1. If the combination of the digital circuit with the internal package, it can provide the 4-20mA output signal, HART protocol optional.

Widely used in chemical, water and electricity, metallurgy and other industrial areas of the capacitive transmitter, which is the core part of its Capsule.

Features:

Use of advanced customized anaerobic sintering furnace, sensor filled pipe and glass sintering with atmospheric isolation, filled pipe does not produce oxide layer, to avoid the short circuit phenomenon caused by oxide sensor center diaphragm and between the capacitor plates.

Adopt computer control positioning and tensioning technology, make the center diaphragm accurate positioning, moderate tension, accuracy is greatly improved.

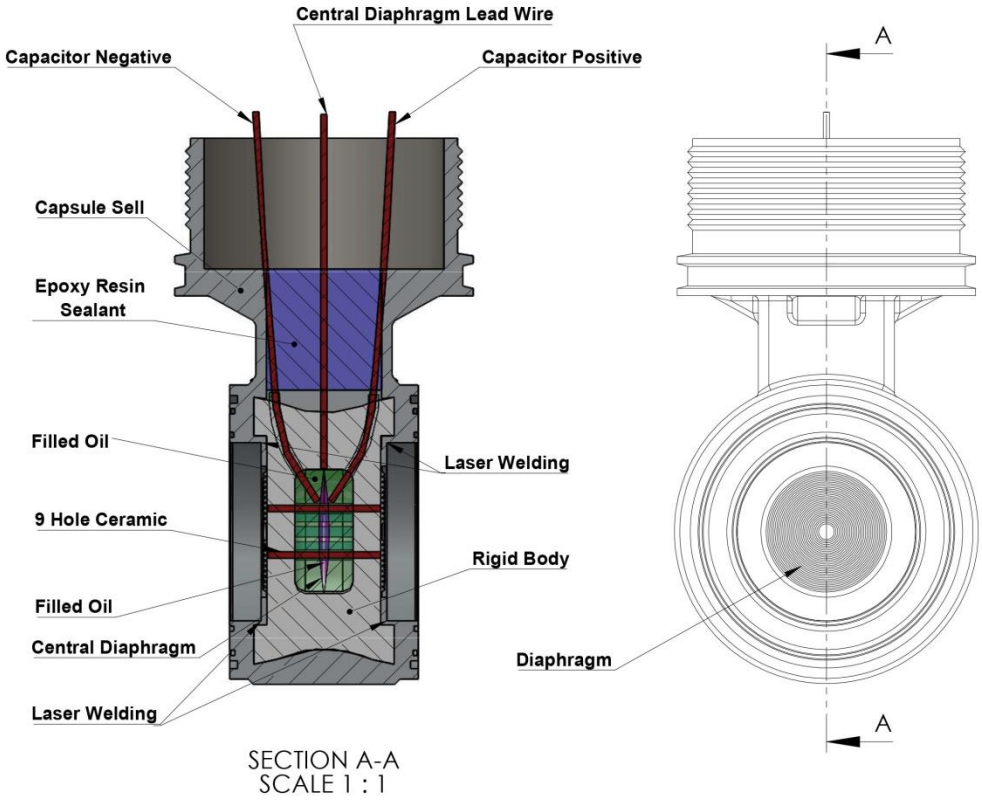
Adopt imported high quality material and the center diaphragm filled with silicone oil.

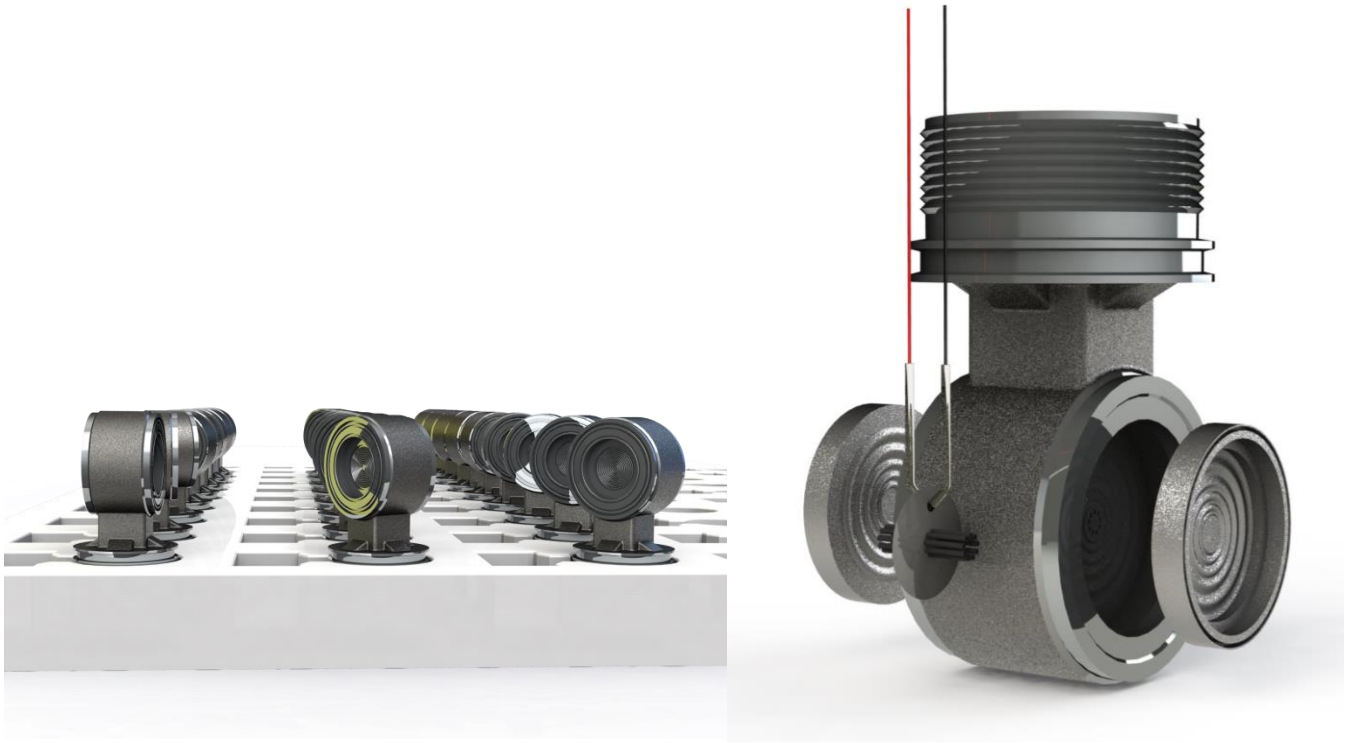
every film box strictly according to the process after more than 1000 time of fatigue aging test, and ensure the stability of the product by 5 ~ 60MPa bi-directional single overload test and static test.

High Temperature Wire

Red	**H Terminal**
White	**L Terminal**
Black	**Shell**
Blue	**Temperature +**
Green	**Temperature -**

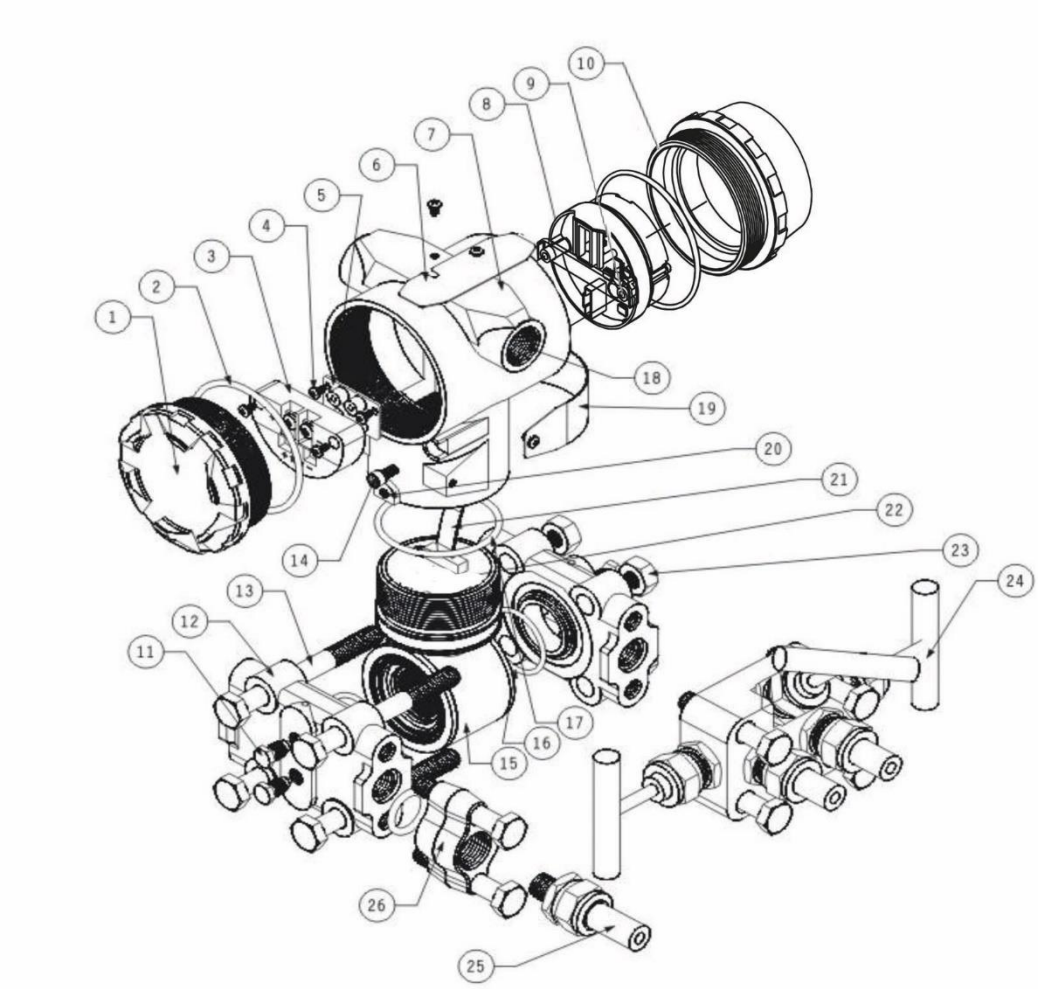
Sensor Diagram





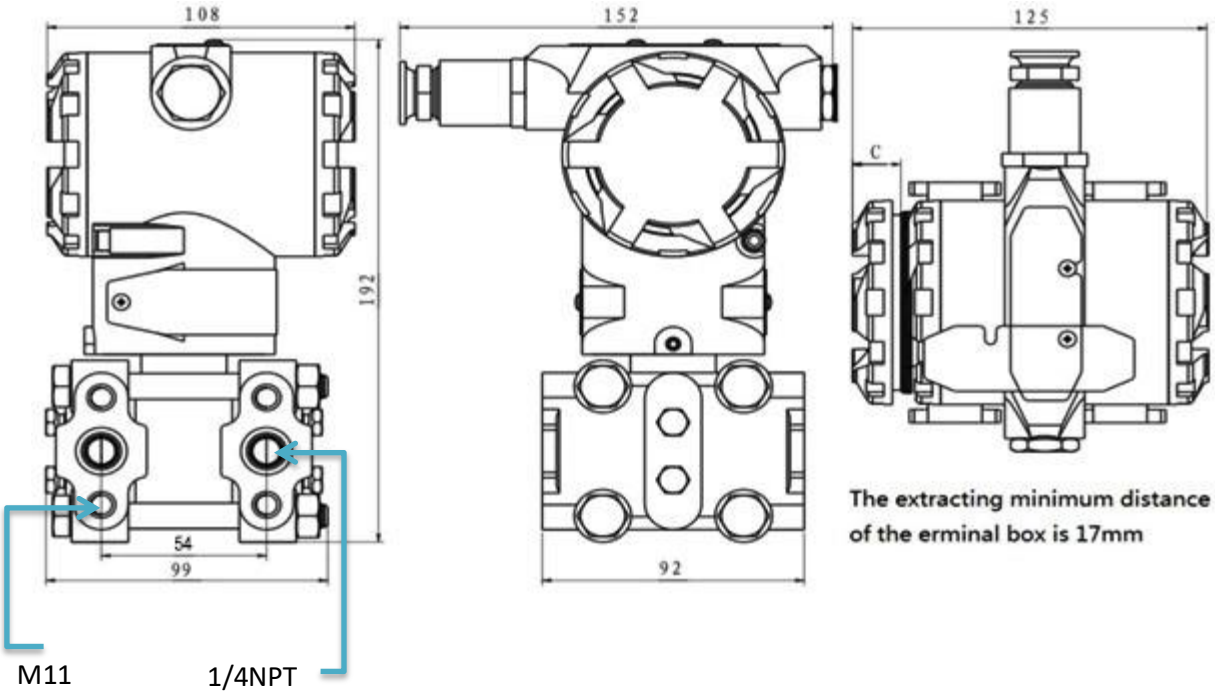
Assembly Drawings

FT3351CD Assembly

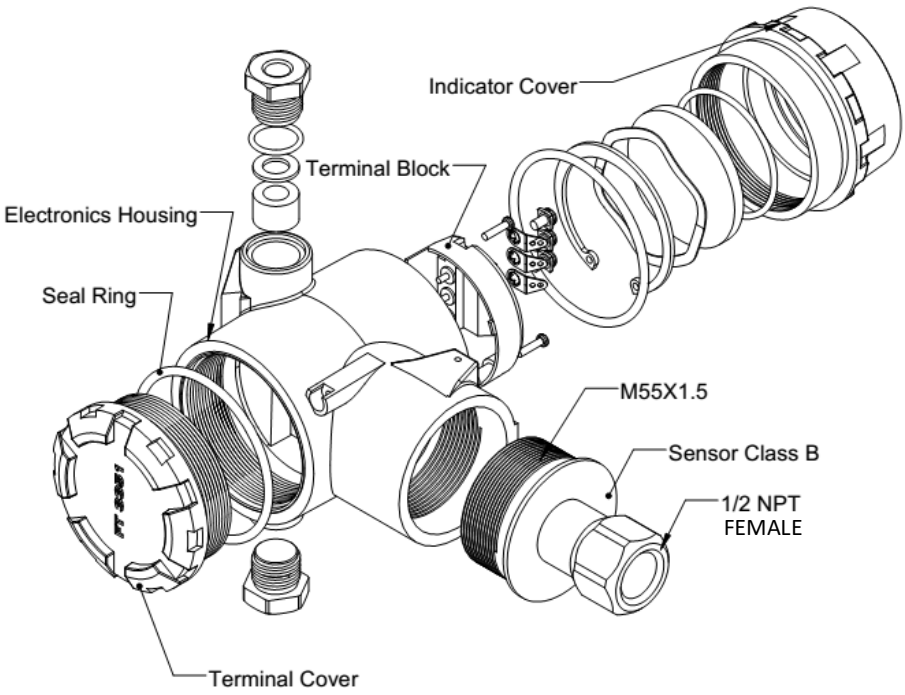


01	Terminal Cover	02	Seal Ring	03	Wire Terminal Cover with Integral Transient Protection Board	04	Mounting Bolt of Circuit Board	05	Connection Circuit Board for lightning
06	Tag Plate	07	Housing	08	Indicator & Circuit Board	09	Mounting Bolt of Indictor	10	Indicator Cover
11	Drains/Vents	12	Molding Board	13	Bolt M10	14	Cover Bolt	15	Sensor
16	Seal Ring	17	Seal Ring	18	Position No. Plate	19	Name Plate for Zero Adjustment	20	Housing Bolt
21	Wire	22	Sensor Module	23	Nut M10	24	Integrated Three-Valves Manifolds (0ption)	25	Welded Connector 9(Optional)
26	Oval Flange1/2 (Option)	27	Electrical Connector						

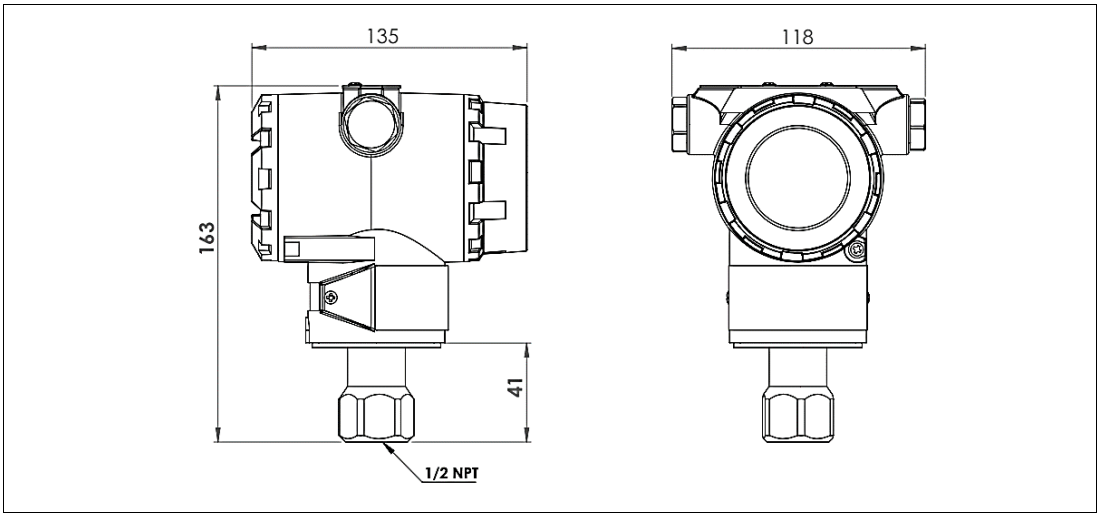
SMART Pressure Transmitter Dimensional Drawings FT3351D



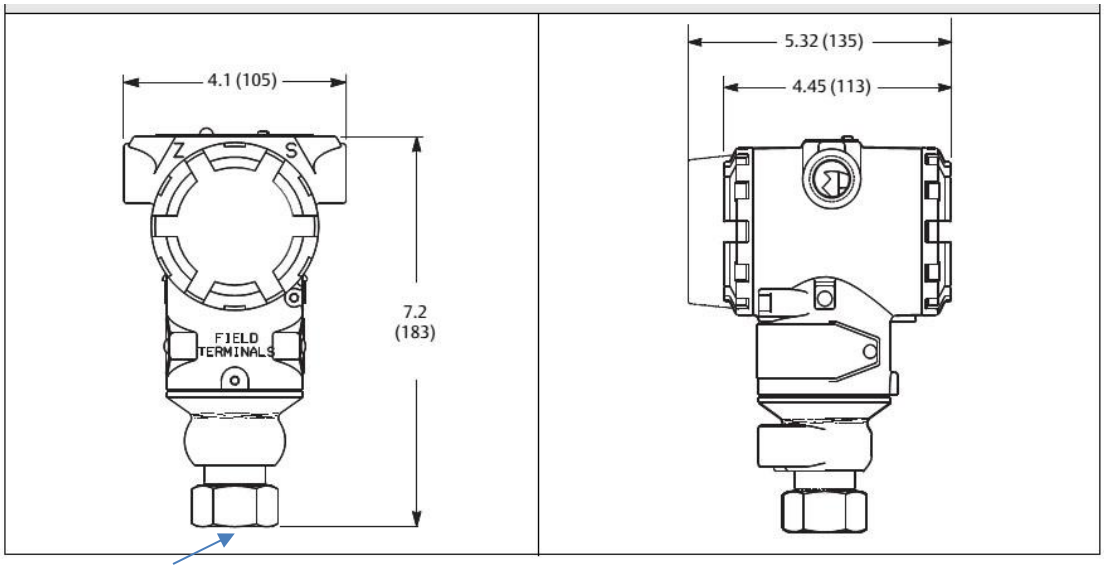
FT3351CG Assembly



Standard FT3351CG & FT3351CA Dimensional Drawings

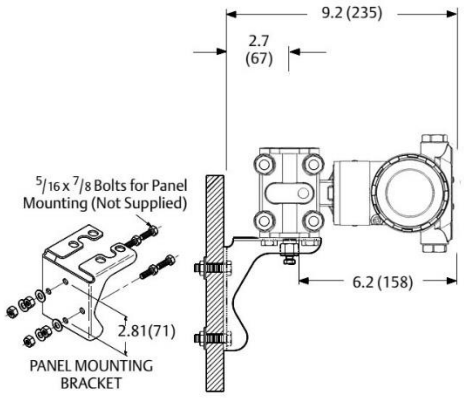


Standard FT3351B Dimensional Drawings

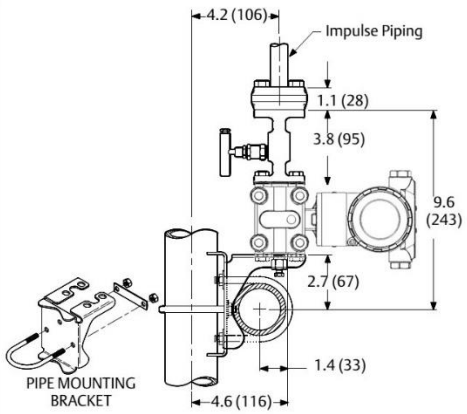


Standard Flange Mounting Configurations with Optional Bracket for 2- inch Pipe or Panel Mounting

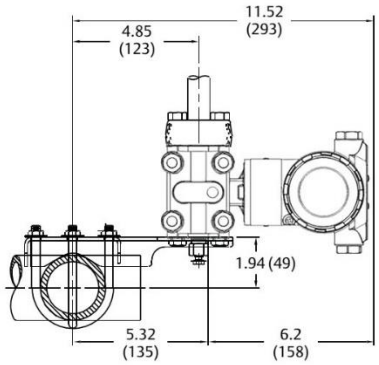
Panel Mounting Bracket (option B2/B8)



2-in. Pipe Mounting Bracket (option B1/B7/BA)

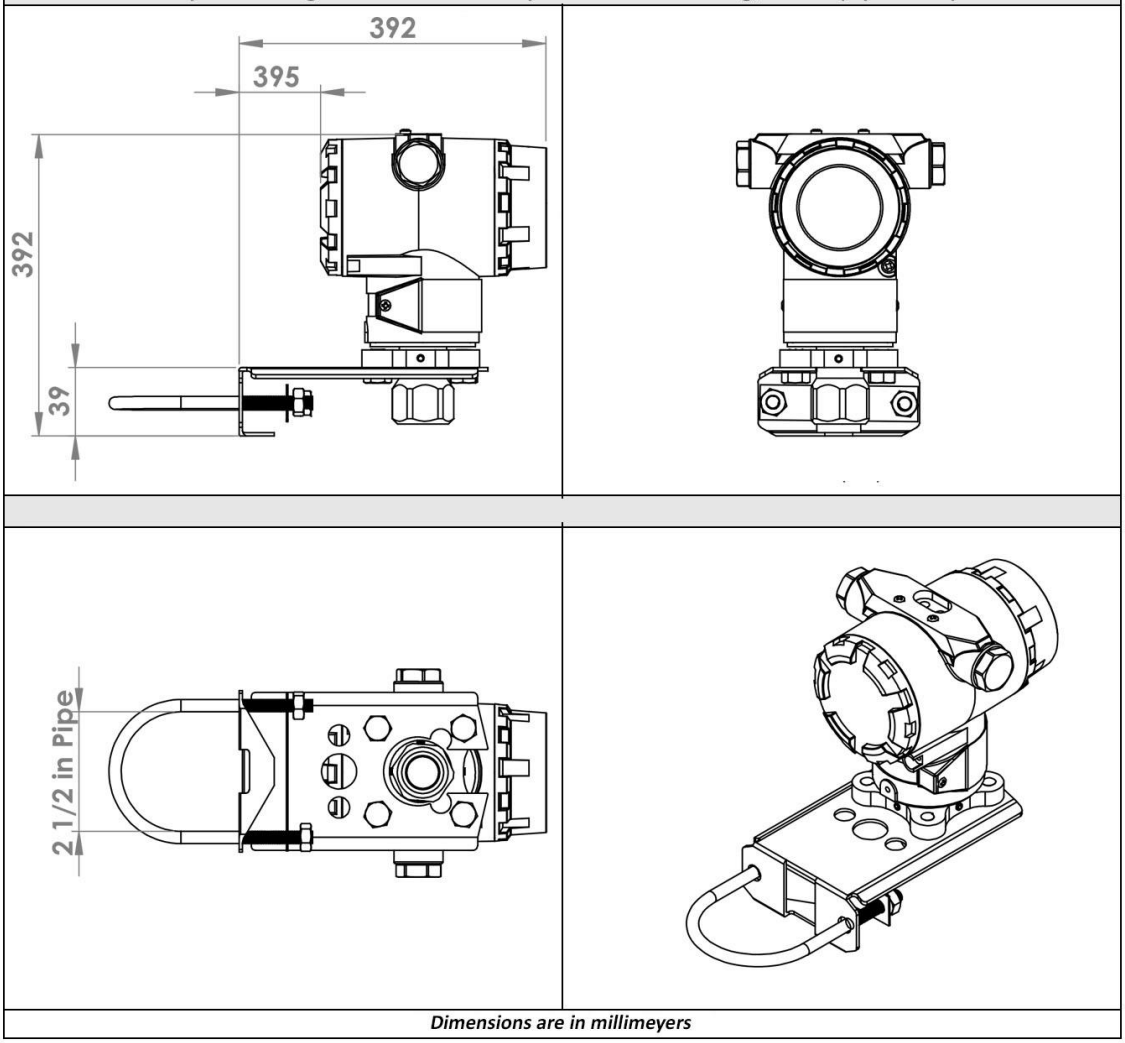


2-in. Pipe Mounting Bracket (option B3/B9/BC)



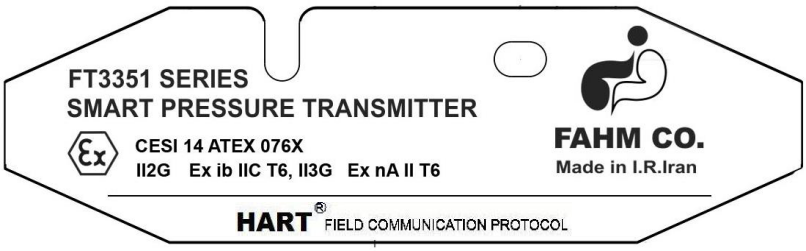
Dimensions are in inches (millimeters)

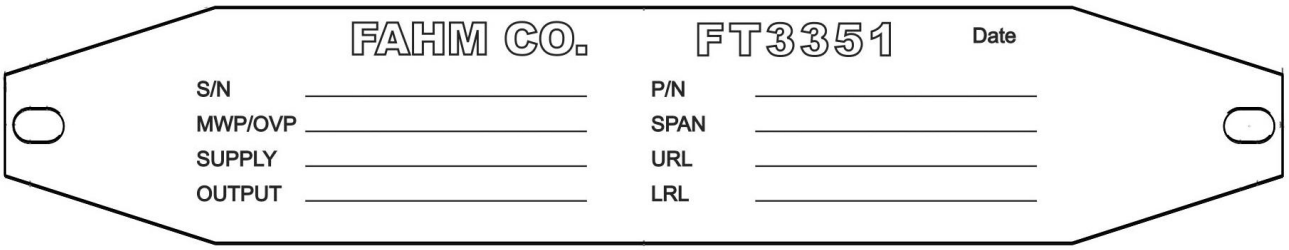
Coplanar Flange Bracket for 2-in. Pipe or Panel Mounting, all SST (Option B4)



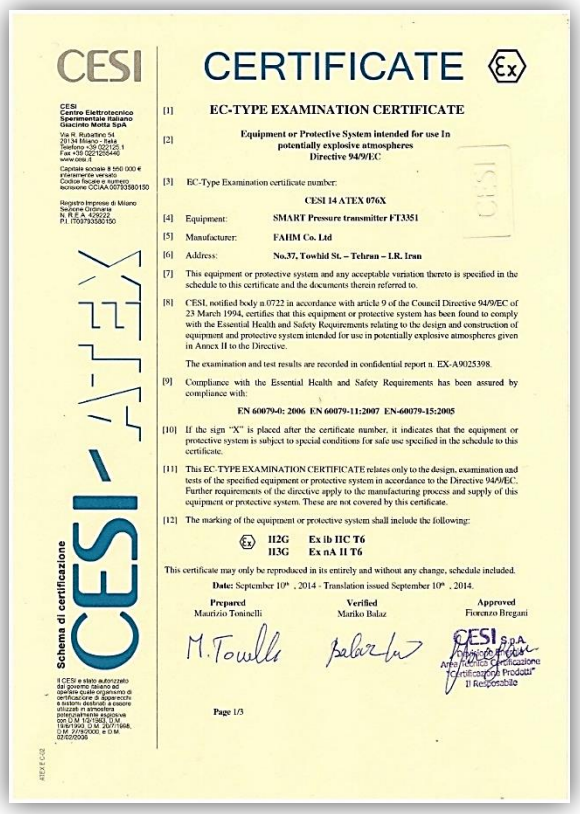
Dimensions are in millimeyers

SMART Pressure Transmitter Information Plates (Top & Bottom)





Product Certifications:


CESI CERTIFICATE

EC-TYPE EXAMINATION CERTIFICATE

[1] EC-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System intended for use in potentially explosive atmospheres Directive 94/9/EC

[3] EC-Type Examination certificate number: CESI 14 ATEX 076X

[4] Equipment: SMART Pressure transmitter FT3351

[5] Manufacturer: FAHM Co. Ltd

[6] Address: No.37, Towhid St. – Tehran – I.R. Iran

[7] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] CESI, notified body n 0722 in accordance with article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-A9025398.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0: 2006 EN 60079-11:2007 EN-60079-15:2005

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EC-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

[12] The marking of the equipment or protective system shall include the following:

II2G Ex ib IIC T6
II3G Ex nA II T6

This certificate may only be reproduced in its entirety and without any change, schedule included.

Date: September 10th , 2014 - Translation issued September 10th , 2014.

Prepared: Maurizio Tosinelli | Verified: Mariko Balaz | Approved: Fiorenzo Bregani

Page 1/3

Explosion Proof: II 2 G Ex ib IIC T6, II 3 G, Ex nA II T6, T6 (Ta ≤ +50 °C)

Rated Voltage: 11-29.4 V

Output Signal: 4-20 mA

I1 ATEX Intrinsic Safety; Type n

Certificate: CESI 14 ATEX 076X

Standards: EN 60079-0: 2006, EN 60079-11: 2007, EN 60079-15:2005

Intrinsically safe II 2G Ex ib IIC T6, mount in zone 1
II 3G Ex nA II T6, mount in zone 2

Supply Circuit	Output	Measuring
Max Voltage	Ui = 29.4 V	Uo=5 V
Short-circuit current	Ii = 130 mA	Io=3.2 mA
Max Power	Pi = 0.8 W	Po=16 mW
Internal inductance	Li= 240 uH	L0=1 mH
Internal capacitance	Ci= 10 nF	Co=10uF

FAHM Co.
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Factory: Sanat 2 St.,Garmsar Industrial Zone.
E-Mail: sales@faraboard.com